

PRIVILEGED AND CONFIDENTIAL
ENVIRONMENTAL INVESTIGATIONS
ROTH BROS. SMELTING CORP. - PLANT 1
EAST SYRACUSE, NEW YORK

by

H&A of New York
Rochester, New York

for

Nixon, Hargrave, Devans & Doyle
Rochester, New York



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SECTION 1 OF 2

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The enclosed Environmental Investigations Reports were performed at the Roth Bros. Smelting Corporation for Plant 1. Two investigations were performed, and the results are presented in two sections. Section 1 presents the results of the initial environmental investigation; Section 2 presents the results of an additional investigation, completed as a result of findings and recommendations in the initial investigation.



CONTENTS

SECTION 1	Environmental Investigation Roth Bros. Smelting Corporation Plant 1 East Syracuse, New York
SECTION 2	Additional Environmental Investigation Roth Bros. Smelting Corporation Plant 1 East Syracuse, New York

EXECUTIVE SUMMARY

H&A of New York performed an environmental investigation of Plant 1 of the Roth Bros. Smelting Corporation site in East Syracuse, New York. Based on site information available and a walkover at the outset of this project, the investigation was performed to evaluate: (1) the potential presence and nature of heavy metal compounds (lead, chromium and cadmium) at selected plant areas, (2) the potential for petroleum product presence in the subsurface at a former gas station, and (3) potential effects of select neighboring properties on site soil/sediment conditions. Three areas of the facility were studied and have been identified generally as the former gasoline station, the Oberdorfer foundry property line and a grassy (fill) area. In order to evaluate these areas and based on available information, H&A developed a site-specific investigation program consisting of a site walkover, review of readily-available information regarding site use, history and local geologic setting, a limited subsurface exploration and sampling program and laboratory analyses, and a soil vapor survey.

Results of the soil vapor survey, consisting of 14 sample points in the former gasoline station vicinity, do not indicate the significant presence of volatile organic compounds (VOCs) in soils at the locations sampled. Total VOCs detected ranged in concentrations from 0.03 ppm to 0.44 ppm in the samples. Compounds were generally reported as unknown VOCs; the compounds detected include benzene, toluene, ethylbenzene and xylenes. All compounds of petroleum fuels were detected inconsistently and at only 3 locations. It is H&A's opinion that low levels are not indicative of significant petroleum tank leakage at the former station. No further action is recommended regarding the former gasoline station.

The Oberdorfer Foundry is listed by the NYSDEC as an inactive hazardous waste site. Laboratory analyses of site soil samples collected along the neighboring Oberdorfer foundry property line indicate the soils were not above TCLP regulatory thresholds for lead, cadmium, and chromium indicating the soils sampled are not characteristically hazardous for those metals.

Two soil samples were collected in the grassy fill area. The analytes lead, chromium and cadmium were not detected by the TCLP method for these samples.

The distribution of detected high concentrations of metals was variable but was associated with shallow soil fill samples. Such high metal concentrations in surface and near surface soils, particularly lead and cadmium, commonly result from



deposition of airborne lead/cadmium from automobile and industrial emissions. Precipitation events, and particularly snow melt events, tend to concentrate the metals in parking lot runoff and the areas where such runoff is directed (drainage swales, ditches, and areas where snow is piled). Since none of the samples were characteristically hazardous as indicated by the TCLP analyses and the levels detected appear to be consistent with values resulting from atmospheric deposition and runoff concentration, it is H&A of New York's opinion that no further investigation is necessary at the fill area.

H&A does recommend a record search of NYSDEC files be conducted to evaluate the status of investigations conducted to date at the Oberdorfer foundry. Should records indicate groundwater sampling associated with the foundry sands has not been conducted or that groundwater contamination exists, H&A recommends three observation wells be installed along the Oberdorfer property line and on Plant 1. The wells would be monitored to determine the groundwater flow direction which may be affected by the presence of the fill piles. Groundwater would be analyzed for the presence of phenols, metals (total and soluble) and other compounds (i.e., cyanide) that may be associated with the fill piles, based on the file review.



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I. INTRODUCTION

H&A of New York (H&A) has performed an environmental investigation on the Roth Bros. Plant 1 property in East Syracuse, New York, to assist Roth Bros. Smelting Corporation in evaluating three areas of concern identified by Nixon, Hargrave, Devans & Doyle (NHDD).

Roth Bros. Smelting Corporation (Roth Bros.) operates two adjacent plants (Plant 1 and Plant 2). This investigation addresses the Plant 1 property. The three areas of concern may be described as follows:

- o An apparent fill area at Plant 1, located in a grassy lot immediately east of the Plant 1 aluminum turnings handling area.
- o A former gasoline station located along Thompson Road and surrounded by the grassy fill area.
- o The drainage swale and soils along the common property line with the adjacent Oberdorfer Foundry. The foundry uses its property immediately adjacent to Roth Bros. Plant 1 for landfilling of foundry sand. The foundry is also listed on the NYSDEC Registry of Inactive Hazardous Waste Sites, as a result of the foundry sand landfilling.

Our investigation consisted of a site walkover; review of readily-available information concerning surface topography and water conditions and subsurface soil, bedrock and groundwater conditions; review of available aerial photography for the site, the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Sites; a soil vapor survey; a limited subsurface investigation consisting of test pit exploration and test borings; and limited sampling and laboratory analysis of soil.



II. SITE LOCATION AND CURRENT CONDITIONS

2-01. SITE LOCATION

The site is located at 6223 Thompson Road in East Syracuse, New York (See Project Locus, Figure 1). Roth Bros. Plant 1 is bounded by Oberdorfer Foundries, Inc. on the north; Thompson Road on the east; Hoffman Air & Filtration Systems Company on the south; and ~~railroad tracks and Roth Bros. Plant 2 on the west~~. Businesses along the east side of Thompson Road were observed to be primarily associated with automobile repair and gasoline service stations.

2-02. SITE OPERATIONS

The Roth Bros. Smelting Corp. was established in 1927. Their operations began at the Thompson Road site in the early 1950's (1,2*). Plant 2 was added in the mid-1950's. Currently, Roth Bros. occupies a 32-acre property and Plants 1 and 2 occupy over 200,000 sq. ft. of building space. **The facility manufactures aluminum and lead ingots, billets and solder.**

Roth Bros. reclaims non-ferrous metals and alloys through secondary smelting and refining of purchased scrap, drosses and production by-products (generally from drosses reclaimed in on-site solder operations) (3). **Plant 1 is primarily used for smelting operations for aluminum. Historically, zinc alloying operations took place in Plant 1, however Roth Bros. is not currently involved with zinc alloying. Plant 2 is primarily used for the lead smelting operations.**

Scrap metals are processed such that non-economic materials are separated from the valuable metal components through a **series of physical and chemical reactions using refractory-lined furnaces.** The end products are lead and aluminum with controlled amounts of impurities.

2-03. CURRENT CONDITIONS

Observations made of site conditions apparent at Plant 1 during H&A's investigation are shown on Figure 2 and described below:

* Numbers refer to "References" attached to the end of this report.

- o Dick's Transmission Shop is at the east end of Plant 1, adjacent to Thompson Road. The ground surface at the shop is paved; asphalt patches, possibly related to installation or removal of underground tanks, were observed on the pavement.
- o The property surrounding the transmission shop at the east end of Plant 2 is primarily grassy. A steel fence separates this area from the aluminum turnings storage yard for Plant 1 (See Figure 2). A concrete pad is along the entrance road to Plant 1 just east of this fence and gate.
- o The yard for Plant 1 (west of the steel fence) is used for storage of crates, bins and filings. There is an oil/water separator near the east end of the yard. The entire yard is covered with blacktop, although it was reported that an area in the southeast corner of the yard was recently paved in an effort to better control surface runoff. The west and north edges of the newly paved area marks the location of a former fenceline (See Figure 2).
- o Southwest corner of Plant 1 property is currently used for storage of old bins, barrels and scrap materials. Three transformers were present, reportedly non-PCB containing from Plant 1 operations.



III. SITE HISTORY AND PREVIOUS USAGE

3-01. HISTORICAL SITE USAGE

H&A of New York reviewed aerial photographs covering the site and vicinity. Photographic documentation is available through the U.S. Agricultural Stabilization and Conservation Service (4), U.S. Soil Conservation Service (5), the Onondaga County Department of Planning (6) and the Onondaga County Department of Transportation (7). In addition, Roth Brothers maintains limited photographic records of the site (2). Observations made regarding site development are described below according to the vintage of available photographs:

1952: Plant 1 is present, although it is smaller than it is at the present. The eastern portion of Plant 1 appears to be brushy and wooded. The area where Plant 2 is presently located appeared to be an undeveloped parcel (field) (2).

1957: Plant 1 is expanded in size. Some surface debris is noted along the southern boundary of Plant 1 (2). Plant 2 has been built. The ground surface around the plant is unpaved (2).

1959: There is a large building along the driveway entrance to Plant 1 off Thompson Road. This building was reportedly used as an ammunitions factory during World War II and as a chickery (chicken raising) following the War (1). The area east of the Plant 1 yard appears disturbed. What appears to be a drainage ditch is observed leading from the Plant 1 yard in an east-west direction towards Thompson Road. This ditch corresponds to the location of SPDES outfall 005 (See Figure 2). What appear to be fill piles are observed on Oberdorfer property, north of Plant 1.

Nitro 1959

*SPDES
data?
historical?
of explosives?*

1966: Plant 1 buildings appear similar as in 1959 photograph. One building is observed at the eastern end of Plant 1, where Dick's Transmission is currently located. The parcel appears to be paved.

The area immediately southwest of Dick's Transmission appears to have debris fill on the ground surface. The building (chickery) along the driveway is present. Fill piles north of Plant 1 (Oberdorfer property) are present and appear larger than in 1959.



- 1978: Plant 1 buildings appear similar to the 1966 photo. A fenceline appears to define the limit of Plant 1 operations, with Roth Bros. operations west of the fenceline. A concrete pad remains where the former chickery building was located east of the fence. The building and lot where Dick's Transmission are currently located are present. The remainder of the site east of the fence is undeveloped and partly vegetated. A dark straight line is observed across the site in an east-west direction, corresponding to the former open ditch associated with Outfall 005.
- 1981: Plant 1 operations appear similar to those observed in the 1978 photo.
- 1985: Plant 1 operations appear similar to those observed in 1981 photo. There appear to be two trailers on the pad located along the south side of the entrance road. It has been reported that Buffalo Fuel maintained trailers here as a temporary office location (1).

3-02. PREVIOUS ENVIRONMENTAL INVESTIGATION

A limited amount of data from previous environmental sampling was available for H&A's use in evaluating the site (15). Five locations were sampled on Plant 1 property as follows:

- o Aluminum Turnings Area: Two samples (J8275, J8276) were analyzed for oil and grease. Laboratory results indicate the presence of oil and grease at concentrations ranging from 5,400 to 6,000 ppm.
- o Oberdorfer Property Boundary: Two sample locations (J8279, J8282) were analyzed for semi-volatiles, total metals, TCLP metals, and phenols. Semi-volatiles detected include:

- ~~Benzo(a)anthracene~~ at 72 and 380 ppm (reported as an estimated concentration by the laboratory).

- Bis(2-Ethylhexyl Phthalate) at 89 and 360 ppm (reported as an estimated concentration).

- Benzo(a) pyrene at 460 ppm.

should be detected

These compounds detected are products of combustion of fuels. Benzo(a)pyrene is also a common constituent of roadbed and asphalt leachate. Bis(2ethylhexyl phthalate) is also a commonly used lab extraction compound.



Total metals were analyzed for at the Oberdorfer property line. One sample had detectable concentrations of lead, mercury and cadmium. However, analysis of these metals by TCLP did not detect them above EPA regulatory levels and therefore these soils are not considered hazardous by this method.

Phenols were not detected above laboratory detection limits.

3-03. POTENTIAL SOURCES OF OIL AND HAZARDOUS MATERIALS

Based on review of information available at the outset of the project, H&A's site walkover and review of site history, the available information on potential occurrences of oil or hazardous materials was refined. Potential on-site sources of oil or hazardous materials are identified and described below:

Former Gas Station: A portion of the east end of Plant 1 owned by Roth Bros. currently operates as Dick's Transmission Shop. The property has been leased from Roth Bros. for about 10 years. Reportedly, the property formerly operated as a Mobil gasoline station and underground gasoline tanks were pulled from the station about 1973 (1). Roth Bros. recently (Summer 1990) excavated in the reported vicinity of the underground tanks and did not locate tanks at that time (1). Currently, there is an underground fuel oil tank at the northwest corner of the building and an above-ground waste oil tank at the southwest corner of the building. In the vicinity of the waste oil tank, H&A observed two truck mounted gasoline tanks, as well as oil stains on the ground surface. The stains appeared to be the result of incidental spillage associated with the waste oil tank.

Above-ground Tanks: Roth Bros. maintains two above-ground 15,000 gallon tanks for the storage of #2 fuel oil. The tanks are located along the Plant 1 southern property line. The oil is stored for emergency backup fuel purposes. An above-ground tank, located at the west end of Plant 1, is used to store chlorine. Chlorine gas is used to remove magnesium during aluminum processing operations.

No surface staining was present around the fuel tanks. Further, there was no observable evidence of spillage or reported releases associated with these above-ground tanks.

Oil/Water Separator: Roth Bros. maintains an oil/water separator in the Aluminum Turnings Area. Following separation, water is discharged to SPDES Outfall 005, located east of the fence between the grassy area and the aluminum turnings area.

(Figure 2). Outfall 005 is piped underground and eastward toward Thompson Road. This was formerly the open ditch described in the aerial photograph review. Waste oil is periodically collected from the separator and taken off-site by a licensed waste oil hauler (9).

Grassy (Fill) Area: The grassy area at the eastern portion of the site was observed at the ground surface to have received some fill materials (i.e. concrete, metals scraps, sand and gravel). A small pile of debris was observed at the ground surface including tires, roadway guardrails, and three crushed empty drums. This area appeared disturbed in aerial photographs; based on the fill materials exposed at the surface and the area's appearance on the photographs it is concluded this area has received fill in the past.

Offsite, potential sources of oil and hazardous materials were observed as follows:

- o Oberdorfer Foundry is located on Thompson Road adjacent to Plant 1 on the north. Oberdorfer manufactures aluminum castings and centrifugal pumps. The foundry is listed on the NYS Department of Environmental Conservation (DEC) Registry of Inactive Hazardous Waste Sites. The foundry disposed of spent core sand, refractory linings, air control equipment and air control equipment dust (8). These sands are located immediately north of the northern Plant 1 boundary, as shown on Figure 2. The DEC's investigation conducted in 1979 indicated there were no phenols in excess of applicable water quality standards detected in surface water (8).
- o West of Plant 2 property, there is an industrial park with businesses including a pattern maker, Ashland Chemicals, Georgia Pacific, Metal Specialty Corporation and Union Carbide-Linde Division (gas products), as well as other businesses. The industrial park is approximately 500 ft. west of Plant 1.
- o Hoffman Air & Filtration Systems Co. is located immediately south of Plant 1. Hoffman produces centrifugal blowers and exhausters, filtration and vacuum systems.

Except for the Oberdorfer Foundry, no reports of spills or releases of oil or hazardous materials were noted in information available for this investigation.

IV. SUBSURFACE INVESTIGATIONS

Based on H&A's review of past site usage and on information provided at the outset of this investigation, a limited site exploration and sampling program was conducted to further evaluate the potential release of oil or hazardous materials from the possible on site sources described above, and the Oberdorfer foundry sand fill area. Four areas, the grassy (fill) area, the Oberdorfer property line, Dick's Transmission Shop, and a background sample location were identified and as designated as locations for sampling and analysis. Site geologic conditions, investigations and environmental sampling are discussed in more detail below.

4-01. REGIONAL GEOLOGIC CONDITIONS

Bedrock which reportedly underlies the site is mapped as the Vernon Formation, composed of shale and dolostone of the Upper Silurian (10).

Unconsolidated deposits which are mapped at the site vicinity are lacustrine silt and clays. These lacustrine deposits are typically composed of laminated clay and silt size particles deposited in proglacial lakes (11).

4-02. SITE SUBSURFACE CONDITIONS

Subsurface explorations for the purpose of analytical testing and subsurface characterization of the site consisted of test borings and test pits. The explorations were performed by Parratt Wolff, Inc. of Syracuse on 24 August 1990 at locations identified and monitored by H&A of New York personnel.

Exploration locations are shown on Figure 2, and a summary of the exploration data is presented in Table II. Test pit logs comprise Appendix C and test boring logs are located in Appendix B. Explorations were backfilled to ground surface upon completion with cuttings or soil/fill from the explorations; backfilling of test pits was performed so as to replace materials in the pits at their approximate original depth.

Test borings were used to explore the grassy fill area and test pits were used to sample along the Oberdorfer property line. A background soil sample location was selected in the southeastern corner of the property. This location appeared to be least disturbed based on a review of aerial photographs for the site.

4.2.1 Grassy (Fill) Area

A total of five test borings, designated B101 through B105, were completed in the fill area. These borings were advanced to a depth of 6.0 ft. by a truck-mounted Diedrich D-50 rotary drill rig using 3-3/4 in. hollow stem augers. Soil samples were obtained in accordance with ASTM Specification D1586-84 with the exception of using a 3.0-in. O.D. split spoon sampler instead of the standard 2.0-in. O.D. split spoon. The 3.0 in. diameter spoon was used to collect sufficient soil for the intended laboratory analyses.

Fill was encountered ranging in depth from 2.5 to 4.6 ft. The fill consisted mainly of granular material (sand, silt and gravel) with traces of brick, cinders and wood. The fill was underlain by lacustrine sand and silt.

4.2.2 Oberdorfer Property Line

A total of three test pits, designated TP19 through TP21, were completed along the Oberdorfer Property line. Test pits were excavated to a depth from 2.5 to 3.0 ft. using a John Deere 410-D rubber-tired backhoe. Soil samples were obtained from the spoils pile adjacent to the test pit.

Fill was encountered ranging in depth from 1.2 to 3.0 ft. It consisted of granular material (gravel, sand, and silt). A layer of cinders was encountered in TP19 below the granular fill. The fill was underlain by lacustrine silt.

4.2.3 Background Soil

One test boring, designated B106, was completed in the southeastern corner of the site in order to obtain a background soil sample. It was advanced to a depth of 4.0 ft. Soil strata encountered were glacial till to 2.0 ft., underlain by lacustrine silt.

4.2.4 Organic Vapor Screening

Soil samples and air space above test borings and within test pits were routinely screened for volatile organic compounds (VOCs) using an HNU photoionization detector model PI 101, equipped with an 11.7 eV lamp. VOCs in excess of background levels were not detected in the screening performed.

4-03. GROUNDWATER CONDITIONS

Surface water flow in the vicinity of the site is to the north toward south Branch of Ley Creek. Groundwater, when encountered during explorations, was generally within a few feet of the ground surface in the unconsolidated lacustrine deposits.

Soil samples were generally wet below approximately 4.0 ft. in the test borings at the east end of Plant 1. Groundwater was encountered in two of the three test pits along the Oberdorfer property line. Depth to groundwater was 1.7 ft. in the eastern-most test pit excavated close to the gate (TP19) and 2.8 ft. in the test pit excavated near the propane storage shed.

V. SAMPLE ANALYSES AND RESULTS

5-01. SOIL VAPOR SAMPLING

In-situ soil vapor sampling was performed at Dick's Transmission along Thompson Road to evaluate the potential presence of petroleum fuel in the subsurface. Sampling consisted of removing samples of pore space air from below the ground surface and analyzing the air (soil vapor) samples for the apparent presence of volatile organic compounds.

Soil vapor sampling was conducted adjacent to and around the reported former underground gasoline tank locations, the 500-gallon underground fuel oil tank, the above-ground waste oil tank and also at selected locations on the property perimeter, in order to determine the possible presence and apparent areal extent of volatile organic compounds in vapor phase. Results of the soil vapor survey are shown on Table I and sample locations are on Figure 3.

Soil vadose zone monitoring was conducted by H&A of New York on 21 August 1990. A total of 14 locations were sampled. A detailed description of the soil vapor sampling procedure is contained in Appendix A. Soil vapor samples were obtained at depths which ranged from 2.3 ft. to 3.1 ft. below ground surface. The manually-implaced soil vapor sampling apparatus was utilized for this investigation.

The concentrations of a volatile organic compound in soil vapor may correspond to the concentration of that compound in soil or groundwater; however contaminant distributions between soil vapor, soil and groundwater depend upon several factors such as soil temperature, barometric pressure, variations in soil moisture and composition, and percent organic carbon. Therefore, the data collected by this evaluation method is semi-quantitative, and is used as such in this report.

5-02. SOIL VAPOR SURVEY RESULTS

The results of the soil vapor survey conducted at Dick's Transmission Shop are presented in Table I. Volatile organic compounds (VOCs) for which analyses were conducted during this survey include benzene, toluene, ethylbenzene, m-xylene, and o-xylene (BTEX compounds). These VOCs are components of petroleum products that are typically encountered at gasoline service stations.

In summary, VOCs were detected in samples SV-01 through SV-14 with total VOC concentrations ranging from 0.03 ppm to 0.44 ppm. The compounds were primarily reported as unknown VOCs, which represent the sum of unidentified chromatogram peaks quantified against the signal response factor of toluene. BTEX compounds were not detected in most samples and were present at low concentrations in samples from 3 locations.

Trace levels (concentrations below 0.01 ppm) of benzene, ethylbenzene and m-xylene were detected in SV-11 and a duplicate sample SV-11 dup. O-xylene was detected from trace to 0.01 ppm in SV-11 and SV-11 dup. Compounds detected in SV-12 include benzene (0.02 ppm), toluene (0.07 ppm) and o-xylene (trace). SV-11 and SV-12 are in the reported former underground gas tank vicinity and near the former islands, respectively. A trace level of toluene was detected in SV-02, adjacent to Thompson Road.

The unknown peaks appear to correspond to early eluting vapors that correspond to methane and/or hydrogen sulfide (naturally occurring gases). The low total VOC concentrations detected, and lack of detectable BTEX compounds is consistent with petroleum concentrations derived from urban area run-off and incidental parking lot spillage.

5-03. SOIL/SEDIMENT SAMPLE LOCATIONS

Sampling locations are shown on Figure 2. Table II provides a summary of the sample locations, depths and numbers.

QA/QC Procedures

A quality assurance/quality control (QA/QC) program was established for field collection and laboratory analyses of samples obtained at the site.

One field duplicate sample was collected from test boring B103 in the grassy (fill) area. Field duplicate sample analytical results are presented in Table III with the site analytical results.

Field cleaning blanks (rinsate blanks) were collected using the same handling techniques as other samples. Deionized water, supplied by the analytical laboratory, General Testing Corp., was poured over the sampling implement following decontamination of the sampling implement. Results of analyses are discussed in Section 5.4.4. Field blanks are used to assess the potential introduction of contamination during sample collection and analyses.

Chain-of-custody forms were completed following sample collection, and the forms accompanied the samples to the laboratory. The chain-of-custody forms may be found in Appendix C. Following collection, and during shipment, the samples were kept chilled in coolers.

5-04. LABORATORY CHEMICAL ANALYSES RESULTS

Soil and sediment samples, as well as rinsate blanks, were submitted to General Testing Corporation for laboratory analyses. Each sample was analyzed for the following parameters:

- o Total Metals - lead, chromium, cadmium
- o Toxicity Characteristic Leaching Procedure (TCLP) Metals - lead, chromium, cadmium
- o Polychlorinated biphenyls (PCBs)
- o Grease and Oil (Method 9070)

TCLP analyses test whether or not samples are hazardous by that characteristic. The results of the laboratory analyses are presented in Appendix A and are summarized on Table III.

Concentration criteria were selected to allow comparison of detected lead and PCB values at various sample locations. Such criteria were identified as follows:

- o Metals - The USEPA has established a concentration of 5 ppm lead present in leachate from the Toxicity Characteristic Leaching Procedure (TCLP) analysis as the basis for determining characteristically hazardous lead waste (5 ppm or greater) from non-hazardous (less than 5 ppm).

The EPA has not currently established a total lead standard for soil, however, an action level of 500 ppm has been reported at cleanup sites under review by NYSDEC (16). A 1000 ppm action level has been reported at Superfund sites, in EPA's biogenetic model, in Center for Disease Control policy and by the State of Minnesota (temporary standard) (17). To be conservative, the 500 ppm concentration was used as a comparison criteria.

For chromium, the USEPA health-based criteria of 400 ppm for systemic toxicants was used (12).

There is currently no recommended criteria for cadmium in soils.

80 ppm soil level

- TP20 1.5% 100
11/11/10 1000
for PCBs
- o PCBs - The USEPA has established a range of total PCB concentrations, based primarily on land use and potential for human exposure as a basis for comparing PCB data. Concentrations less than 10 ppm total PCB are generally considered acceptable at most locations. A range between 10 and 25 ppm is considered acceptable depending on land use; 10 ppm is the comparison criteria where residential/commercial land use prevails and 25 ppm (or lower) is generally acceptable in industrial areas. As the site is industrial and surrounded by industrial businesses the 25 ppm concentration was used.

5.4.1 Grassy (Fill) Area

Five samples (B101 through B105) were submitted for analyses from the grassy area at the east end of Plant 1. Total lead, chromium and/or cadmium were detected in soil samples B101 through B105.

PCBs were detected in B101 through B104 at concentrations ranging from 0.063 to 0.950 ppm. No PCBs were detected in B105. The concentrations are well below the USEPA criteria of 25 ppm.

Grease and oil were detected in B101 through B103, and in B105 at concentrations ranging from 210 to 2480 ppm. Grease and oil were not detected above laboratory detection limits in B-104.

Toxicity Characteristic Leaching Procedure (TCLP) tests to evaluate whether samples are characteristically hazardous. Results indicated that none of the samples analyzed had this characteristic. It appears that neither the concentration or chemical form of the lead, chromium and cadmium was conducive to leaching.

5.4.2 Oberdorfer Property Line

Total lead concentrations were detected in soils from TP20 and TP21. Sample TP19 was collected along the Oberdorfer property line and had a reported concentration of 443 ppm total lead.

Chromium (total) concentrations were reported in samples TP19 and TP21 above the 400 ppm USEPA health-based criteria for systemic toxicants. A concentration of 4990 ppm was reported in sample TP20, located along the Oberdorfer property line. TP19 had a concentration of 532 ppm.

Cadmium (total) was not detected above laboratory detection limits for TP19. It was detected in TP20 and TP21 at concentrations ranging from 0.78 to 2.7 ppm.

PCBs were detected in TP19, TP20 and TP21 at concentrations ranging from 0.061 to 9.240 ppm. The concentrations detected fall below the USEPA removal criteria of 25 ppm.

Grease and oil were detected in TP19, TP20 and TP21 at concentrations ranging from 513 ppm to 4980 ppm. There was no visible evidence of grease and oil in the soil at the time of explorations.

5.4.3 Background Soil

One background soil sample (B106) was collected at the southeast corner of Plant 1. Total lead and total chromium concentrations for B106 are 16.2 ppm and 18.6 ppm, respectively. Cadmium was reported as not detected above laboratory detection limits in the background sample.

PCBs were not detected above laboratory detection limits in the background soil sample. Grease and oil were detected at 195 ppm in the B106 soil sample.

5.4.4 QA/QC Analytical Results

Field cleaning blanks were analyzed for the same parameters as the soil samples. Analytical results are reported as not detected above laboratory detection limits for each sample analyzed indicating field cleaning procedures did not result in cross-contamination of samples.

5-05. DISCUSSION

Metals

In the grassy area, total cadmium concentrations were reported in soils, however, cadmium was reported as not detected by the TCLP method. Total lead and total chromium were detected above the laboratory detection limits. However, TCLP results were reported as not detected for the samples analyzed. In summary, soils sampled in the grassy area are not considered hazardous by the TCLP method for lead, chromium or cadmium.

Along the Oberdorfer Property line, total lead and chromium were detected at concentrations above the established comparison criteria. However, TCLP analyses indicate the metals are below the regulatory action levels for lead, chromium and cadmium to be considered hazardous.

In order for a sample to fail TCLP analysis the metal of concern must be present in sufficient concentration and in the appropriate chemical form to allow dissolution and leaching by

the acidic solution used for the TCLP procedure. None of the samples analyzed resulted in significant detectable metals concentrations in the leachate.

It was observed that several of the test pits contained cinders and soil fill associated with concrete and asphalt. Cinders typically contain high concentrations of metals, occasionally up to a percent level. Lead, when contained in cinders is typically in a silicate oxide form which strongly resists re-speciation as would be necessary for TCLP leaching. Based on observations made of test pit soils and fill, it is H&A's opinion that the elevated metals concentrations are associated, at least in part, to the type of fill constituents encountered. ?

An additional common source of heavy metals in soil and sediment is deposition and runoff of airborne urban industrial and automobile emissions. Lead and cadmium are commonly associated with automobile emissions, and all three metals result from industrial sources (13). Precipitation events and particularly roadway/parking lot snow melt tend to flush high concentrations of these metals toward parking lot edges and along drainage swales. It is apparent that shallow samples from the Oberdorfer property line and possibly fill area samples (where associated with asphalt) have metals concentrations that may have been influenced by such processes.

PCBs

PCBs ranged from non-detect to 9.240 ppm at the grassy area, along the Oberdorfer Property Line, and at the background sample location. These concentrations were below the USEPA removal action criteria of 25 ppm.

Grease and Oil

Grease and oil concentrations detected ranged from non-detect to 4980 ppm in the samples tested. The background soil sample is reported to have 195 ppm grease and oil. During the sampling at these locations, there was no visible evidence of grease and oil, nor were any petroleum-like odors noted. The laboratory gravimetric grease and oil analyses detects both man-made grease and oil materials as well as animal and plant derived greases, fats, and oils (14). Vegetative organic matter was observed in several of the test pits excavated. Further, the range of concentrations detected was consistent in the various areas explored as well as with other analyses of non-oil contaminated areas in the plant vicinity which H&A has reviewed. It is concluded that the range of results represent prevailing conditions in the area and not point or source specific oil and grease releases.

VI. CONCLUSIONS

Based on a review of readily-available information, interviews with persons familiar with the site, and limited subsurface explorations and laboratory analyses, the following conclusions with respect to the environmental investigations conducted have been made:

- o Dick's Transmission Shop formerly operated as a gasoline station and is located on the east end of the Roth Bros. Plant 1 property. The underground gasoline tanks have reportedly been removed, and an underground fuel oil and an above-ground waste oil tank are present on site. H&A conducted a soil vapor survey consisting of 14 sample points at the former gasoline station.

In summary, total volatile organic compounds detected ranged in concentrations from 0.03 ppm to 0.44 ppm in the 14 samples. The compounds were primarily reported as unknown VOCs; chromatogram peaks of the unknown compounds appear to correspond to methane and hydrogen sulfide, two naturally occurring decomposition products. Other compounds detected include benzene, toluene, ethylbenzene and xylenes at 3 of the 14 sample locations. Concentrations of VOCs detected in the vapor phase were below 0.50 ppm and, based on our experience, these concentrations are not considered as indicative of leakage or spillage other than that associated with incidental parking lot runoff. No further action is recommended regarding the former gasoline station. *pointy*

- o The Oberdorfer property line along the north side of Plant 1 was evaluated to address the presence of foundry sands immediately adjacent to the Roth Bros. property. Three shallow test pits were excavated. Samples were analyzed for the presence of oil and grease, PCBs and metals (total and TCLP for cadmium, chromium and lead). Of the compounds analyzed, total lead, chromium and cadmium were noted to have detectable concentrations; however, analyses of the soils by the toxicity characteristic leaching procedure did not indicate that these soils were hazardous by this method. Observation of the materials encountered in the test pits indicated elevated metals concentrations may be associated with cinders in the fill and, at certain locations, deposition and runoff from industrial and automobile air emissions. Detected oil and grease concentrations likely represent prevailing conditions in the area and not point or source specific oil and grease releases. *pointy*

H&A recommends a record search of NYSDEC files be conducted to evaluate the status of the investigations conducted to date at the Oberdorfer Foundry. Should records indicate groundwater sampling associated with the foundry sands has not been conducted or that groundwater contamination exists, H&A recommends three observation wells be installed along the Oberdorfer property line and on Plant 1. The wells would be monitored to determine the groundwater flow direction, which may be affected by the presence of the fill piles. Groundwater would be analyzed for the presence of phenols, metals (total and soluble) and other compounds (cyanide) that may be associated with the sands, based on the file review.

- o The area on the east end of Plant 1 property was evaluated as it appeared to have received some fill and apparently had been disturbed in the past. Five test borings were drilled and five soil samples analyzed for metals (total and TCLP), PCBs and oil and grease. Again, cinders and possible industrial automobile emissions may be associated with the metals concentrations. The analytes were not detected by the TCLP method for lead, chromium and cadmium. Also, the range of oil and grease results appear to represent prevailing conditions in the area and not point or source specific oil and grease releases. No further action is recommended for the grassy (fill) area.

vbd34

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7. H&A of New York review of aerial photographs for 1959, Onondaga County Department of Transportation, 23 August 1990.
8. "Inactive Hazardous Waste Disposal Sites in New York State", New York State Department of Environmental Conservation, Volume 7, April 1990.
9. H&A of New York telephone conversation with Mr. Neal Schwartz, General Manager, Roth Bros. Smelting Corp., 12 September 1990.
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14. Enseco, Inc. Laboratory Analytical Protocol, Comparison of Petroleum and Oil Analytical Methods, 1989.

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(con't)

15. Laboratory Analyses Report, provided by Roth Bros. Smelting Corp.
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VBD:gma
vbd34

TABLE I
SOIL VAPOR SAMPLING RESULTS *Plant 1*
ROTH BROTHERS
SYRACUSE, NEW YORK

TENTATIVELY IDENTIFIED VOLATILE ORGANIC COMPOUNDS
(in parts per million)

Sample Location	Probe Depth (ft.)	Benzene	Toluene	Ethyl Benzene	m-Xylene	o-Xylene	Unks.	Total Volatiles
SV-01	3.1	--	--	--	--	--	0.10	0.10
SV-02	2.9	--	tr	--	--	--	0.27	0.27
SV-03	2.9	--	--	--	--	--	0.10	0.10
SV-04	3.0	--	--	--	--	--	0.44	0.44
SV-05	2.9	--	--	--	--	--	0.09	0.09
SV-06	2.9	--	--	--	--	--	0.12	0.12
SV-07	3.0	--	--	--	--	--	0.03	0.03
SV-08	2.9	--	--	--	--	--	0.07	0.07
SV-09	3.0	--	--	--	--	--	0.13	0.13
SV-10	2.9	--	--	--	--	--	0.06	0.06
SV-11	3.0	tr	--	tr	tr	0.01	0.07	0.08
SV-11 dup	3.0	tr	--	tr	tr	tr	0.17	0.17
SV-12	2.7	0.02	0.07	--	--	tr	0.20	0.29
SV-13	2.6	--	--	--	--	--	0.03	0.03
SV-14	2.3	--	--	--	--	--	0.03	0.03

NOTES:

1. (tr) indicates compound present at trace concentrations (below 0.01 ppm).
2. (--) indicates compound not detected.
3. (Unks.) indicates unknown chromatogram peaks summed and quantified as toluene.
4. (dup) indicates duplicate analysis.
5. See report for further information.

TABLE II
ROTH BROS. SMELTING CORP. - PLANT 1
TEST BORING/ TEST PIT DATA SUMMARY

LOCATION	EXPLORATION NO.	TOTAL DEPTH (FT.)	SOIL DESCRIPTION	DEPTH (FT.)	SAMPLE DEPTH (FT.)
GRASSY AREA EAST OF PLANT 1	B101	6.0	Granular Fill Lacustrine	0.0 - 2.5 2.5 - 6.0	2.0 - 2.5
	B102	6.0	Topsoil Concrete Granular Fill Lacustrine	0.0 - 0.8 0.8 - 1.0 1.0 - 3.0 3.0 - 6.0	2.0 - 3.0
	B103	6.0	Granular Fill Lacustrine	0.0 - 4.6 4.6 - 6.0	3.5 - 4.5 (D)
	B104	6.0	Granular Fill Lacustrine	0.0 - 4.2 4.2 - 6.0	1.0 - 2.0
	B105	6.0	Granular Fill Lacustrine	0.0 - 3.9 3.9 - 6.0	3.0 - 3.9
BACKGROUND	B106	4.0	Glacial Till Lacustrine	0.0 - 2.0 2.0 - 4.0	1.0 - 2.0
OBERDORFER PROPERTY LINE	TP19	2.5	Granular Fill Cinders Lacustrine	0.0 - 0.7 0.7 - 1.2 1.2 - 2.5	0.7 - 1.2
	TP20	3.0	Granular Fill	0.0 - 3.0	2.0 - 3.0
	TP21	3.0	Granular Fill Lacustrine	0.0 - 1.5 1.5 - 3.0	1.5 - 2.5

NOTES:

1. (D) indicates sample submitted in duplicate.
2. See Table III for summary of laboratory analytical data.

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FILE NO. 70185-40

70185-40

TABLE III
ROTH BROS. SMELTING CORP.
PLANT 1

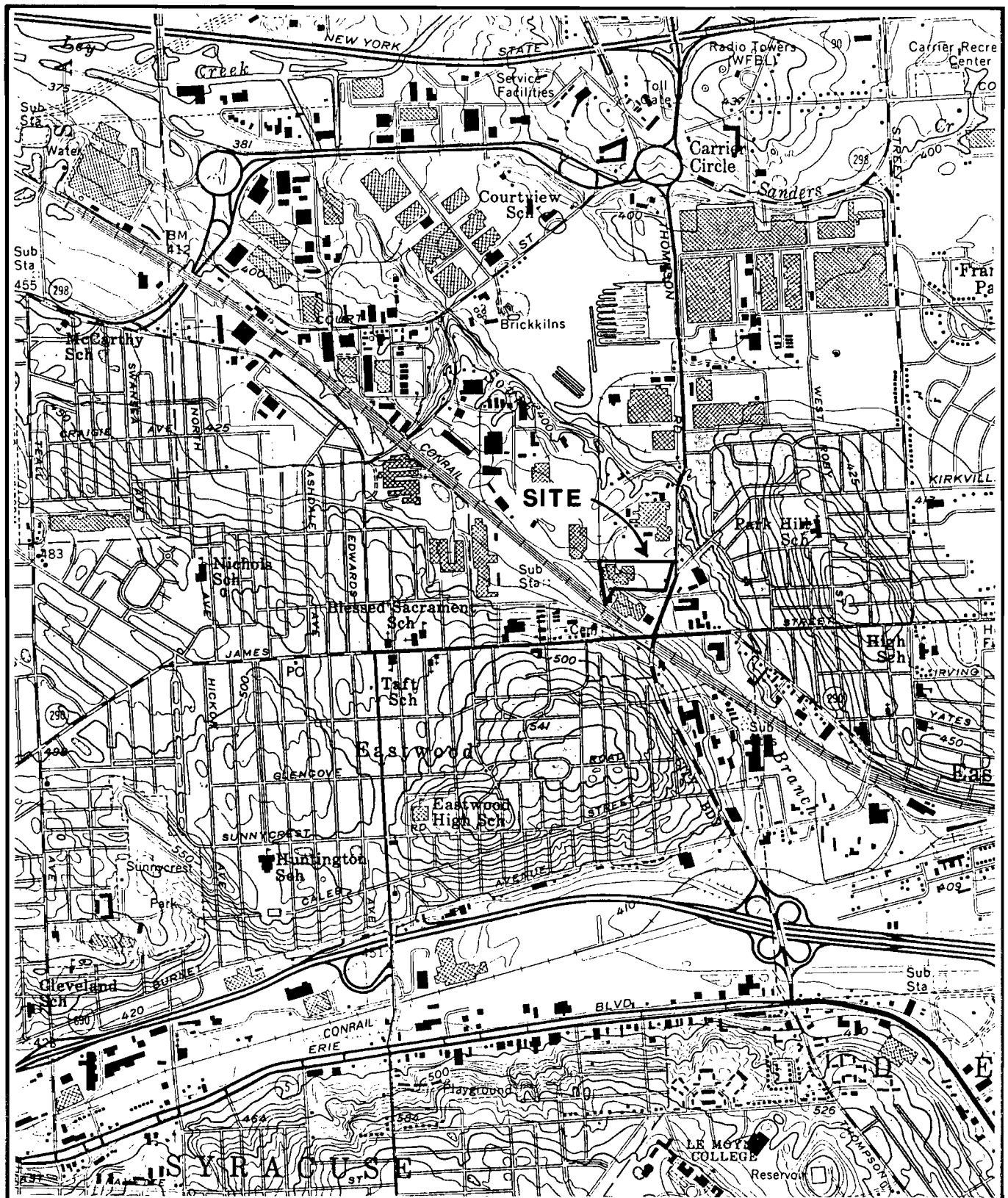
SUMMARY OF LABORATORY ANALYTICAL DATA

LOCATION	SAMPLE NO.	LEAD TOTAL	LEAD TCLP	CHROMIUM TOTAL	CHROMIUM TCLP	CADMIUM TOTAL	CADMIUM TCLP	GREASE AND OIL	PCBs 1242	PCBs 1248	PCBs 1254	PCBs 1260	PCBs TOTAL
GRASSY AREA	B101	89.4	ND	16.7	ND	1.20	ND	2480	ND	ND	0.950	ND	0.950
	B102	41.0	ND	25.7	ND	1.10	ND	1530	ND	ND	0.227	ND	0.227
	B103A	26.4	ND	16.1	ND	ND	ND	398	ND	0.137	0.099	ND	0.236
	B103B*	28.7	ND	16.0	ND	ND	ND	210	ND	0.213	0.168	ND	0.381
	B104	5.10	ND	20.1	ND	ND	ND	ND	ND	0.063	ND	ND	0.063
	B105	25.5	ND	23.6	ND	ND	ND	224	ND	ND	ND	ND	ND
OBERDORFER	TP19	443	ND	532	ND	ND	ND	1750	ND	9.24	ND	ND	9.24
PROPERTY LINE	TP20	105	ND	4990	ND	0.780	ND	4980	ND	4.80	ND	ND	4.80
	TP21	26.7	ND	14.5	ND	2.70	ND	513	ND	0.027	0.0342	ND	0.061
	J8279	120	0.36	16.0	ND	0.44	0.012	NA	NA	NA	NA	NA	NA
	J8282	1300	0.52	120	ND	8.50	0.050	NA	NA	NA	NA	NA	NA
BACKGROUND	B106	16.2	ND	18.6	ND	ND	ND	195	ND	ND	ND	ND	ND
COMPARISON CRITERIA (2)	-	500	5.00	400	5.00	80	1.00	-	-	-	-	-	25

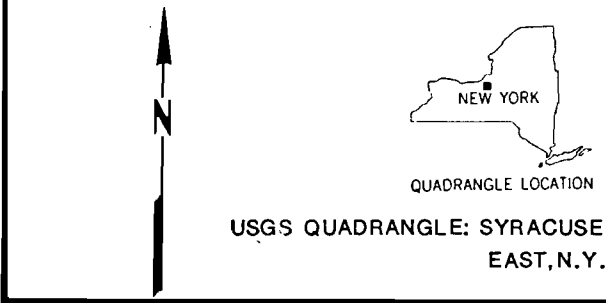
NOTES:

1. Results presented in parts per million (ppm).
2. Outlined values represent concentrations which exceed comparison criteria. Comparison criteria consist of:
 - 1) NYSDEC Recommended Cleanup Goal
 - 2) EPA Regulatory Levels for Toxicity Characteristics Constituents;
 - 3) EPA 40 CFR Part 761 PCB Spill Cleanup policy, 1987; and
 - 4) USEPA Health-based criteria for systemic toxicants.
3. ND indicates analyte not detected above laboratory detection limits.
4. TCLP: Toxicity Characteristic Leaching Procedure
5. * Indicates sample is a duplicate.
6. NA indicates analyte not tested for in that sample.
7. J8279 and J8282 were analyzed by others prior to this investigation.
8. D = Surrogate standards diluted out due to high concentrations of PCBs detected in sample.

edh:70185-40/analyses



FILE NO. 70185-40



H & A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

ROTH BROS. SMELTING CORP.
SYRACUSE, NEW YORK

PROJECT LOCUS

SCALE: 1 IN. = 2000 FT.







MAY 1991

CHARRETTE

FIGURE 1



LEGEND:

- TP06  TEST PIT LOCATION AND NUMBER. TEST PIT EXCAVATED ON 24 AUGUST 1990 BY PARRATT-WOLFF, INC.
- B105  BORING LOCATION AND NUMBER. BORING DRILLED ON 24 AUGUST 1990 BY PARRATT-WOLFF, INC.
- J8277  SURFACE SAMPLE LOCATION AND NUMBER. SAMPLE COLLECTED BY OTHERS PRIOR TO THIS INVESTIGATION.
- 004  SPDES OUTFALL LOCATION.
-  PROPERTY LINE
-  FENCELINE

NOTES:

1. SITE PLAN DERIVED FROM "PLOT PLAN/PROPERTY LINES, BUILDINGS, AND HAZARDOUS WASTE STORAGE", ROTH BROS. SMELTING CORP., 25 MAY 1984.
2. LOCATIONS OF EXPLORATIONS AND SITE FEATURES ARE APPROXIMATE.
3. SEE TEXT FOR ADDITIONAL INFORMATION.

AGA H & A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

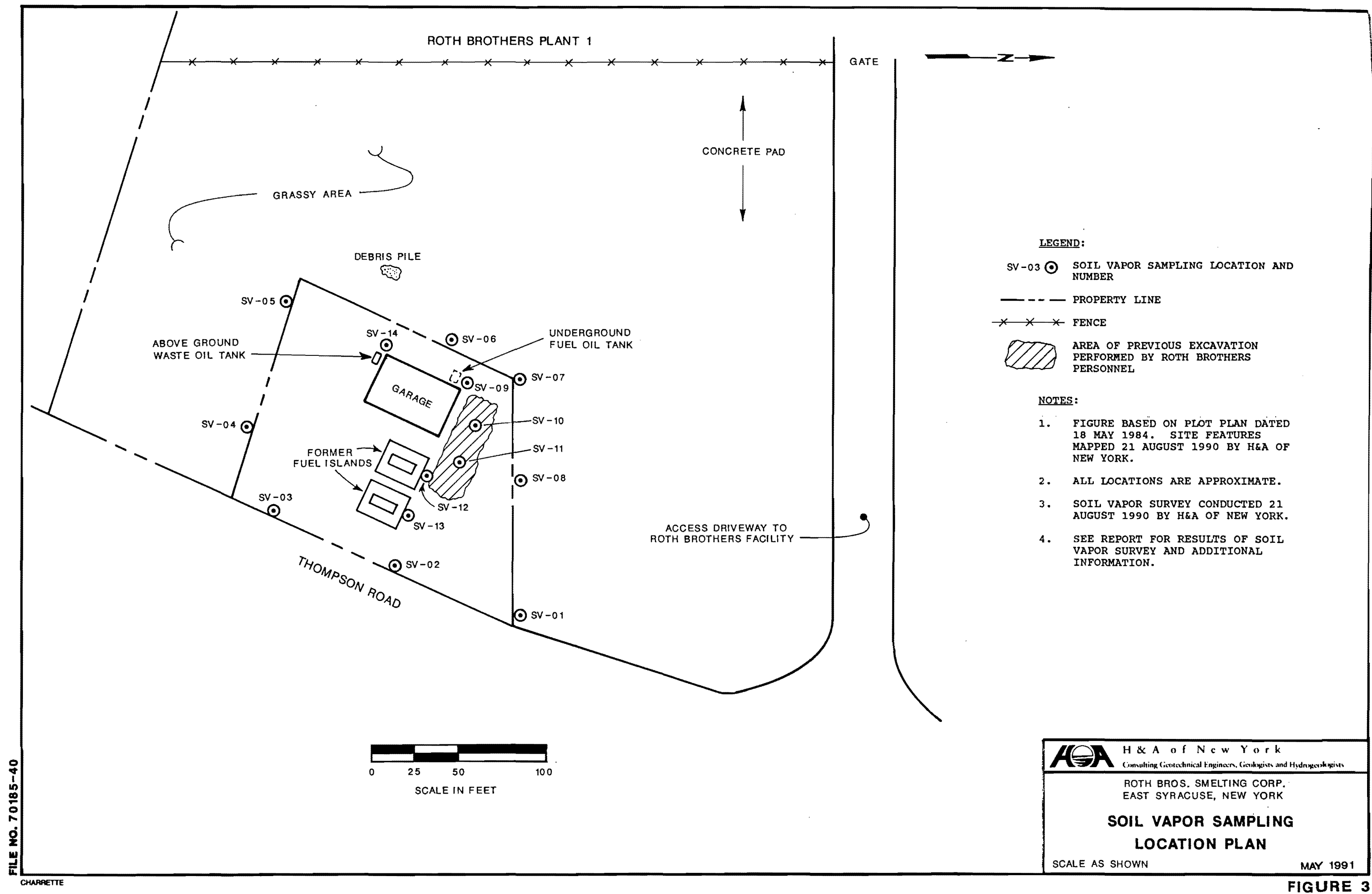
ROTH BROS. SMELTING CORPORATION
EAST SYRACUSE, NEW YORK

EXPLORATION LOCATION PLAN

SCALE: 1 IN. = 100 FT.

MAY 1991

FIGURE 2



APPENDIX A

Soil Vapor Survey Field Investigative Methods



APPENDIX A

Soil Vapor Survey Field Investigative Methods

Unsaturated zone soil vapor surveys generally involve removing samples of pore space air from below the ground surface and analyzing the air for the apparent presence of volatile organic compounds.

Soil Vapor Sampling Techniques

Field methodologies employed during soil vapor surveys vary and depend upon ground-surface conditions. If pavement or concrete floorslab is encountered at a sampling location, a pilot hole is drilled through the slab utilizing an electrically powered rotary-hammer drill equipped with a carbide steel drill bit.

Once the pavement has been penetrated, or if no pavement is present, either of two different probe systems can be used to obtain soil vapor samples; a hammer-driven system which may be used to obtain samples of soil vapor at depths greater than 4 feet, or a manually-emplaced system suitable for shallower sampling. The manually-emplaced system was used for this investigation.

- o The hammer-driven probe system consists of the following items: an electrically powered rotary-hammer, steel drive head attachment, 2.5 ft. long 5/8 inch O.D. hollow hardened steel probe tube sections, and a detachable 5/8 inch O.D. slotted probe head with a solid conical tip. The probe head, sampling tube(s) and drive head attachment are threaded together and driven with the rotary-hammer to specific depths in the soil.
- o The manually emplaced sampling apparatus consists of a weighted 40 or 52 inch long steel plunger bar and a 38 or 50 inch long 0.37 inch O.D. hollow stainless steel sampling tube. The sampling tube has eight 1/8 inch perforations in its lowermost six inches to allow intake of soil vapor. The plunger bar is used to create a sampling hole into which the sampling tube is inserted.

Moistened bentonite clay is packed around the probe tube at the probe/ground surface interface to seal the sample hole from possible influx of atmospheric air during sampling.

The sampling tube is then connected via a stainless steel septum adaptor to an air pump with tygon tubing and the sample hole evacuated of three to five hole volumes, as measured with a variable-area flowmeter and a stop watch. A sample of soil vapor is withdrawn directly from the pumping stream of soil vapor through the septum adaptor at the sampling head using either a 25, 50, or 100 microliter fixed-needle syringe composed of a stainless steel plunger and needle, and a borosilicate glass barrel, or a 50 to 100 microliter Hamilton Series 1700 gas-tight syringe.

The soil vapor sampling probes are cleaned between use at each sampling location as follows:

- o washed with low phosphate detergent
- o rinsed with potable water
- o thoroughly dried

SAMPLE ANALYSIS

Sample analysis is conducted in the field using a Photovac Model 10S50 portable gas chromatograph (GC). A sample aliquot is injected into the GC in a carrier gas stream consisting of ultra-pure zero grade air with a purity of less than 0.1 parts per million total hydrocarbons.

The portable GC is equipped with a 10 meter CPSil5 encapsulated hollow bore capillary column constructed of dimethyl-polysiloxane chemically bonded to the inside of 530 micron hollow bore fused silica tubing. The column is housed in an isothermal oven maintained at 30 degrees centigrade throughout the sampling period.

Reference standards utilized during this investigation consisted of the following:

- o Benzene
- o Toluene
- o Ethylbenzene
- o m-Xylene
- o o-Xylene

Aqueous standards are prepared from stock solutions of the target compounds on a daily basis. For this project the stock solutions were diluted with potable water to specific concentrations which ranged from 0.427 parts per million (ppm) to 0.963 ppm. Aqueous standard headspace air is injected into

the GC at the beginning of each day and periodically thereafter to calibrate the GC, evaluate instrument response and monitor retention times. The concentration of standards and subsequent analyses are calculated and reported as referenced to the aqueous standards.

Samples are obtained from the sample probe and injected with the fixed-needle syringe into the GC. Generally, 50 microliters of sample are injected into the GC for analysis. However, injection volumes may range from 100 microliters to 1 microliter depending upon compound concentrations encountered at specific site locations. Instrument sensitivities are decreased to lower gains for samples where elevated levels of volatile organic compounds are detected to establish reliable chromatography and peak scaling. Duplicate samples may also be collected and analyzed at low instrument gain settings.

Compound identities are determined by comparison of sample retention times with those of known standards. Actual compound identities may differ and must be confirmed by other methods such as laboratory analysis by gas chromatography/mass spectrography.

Detection limits for each of the target standards on the Photovac are approximately 0.01 ppm expressed in relation to the aqueous standards. However, the detection limits of specific compounds will vary depending on their ionization potential, vapor pressure, water solubility and temperature. The concentration of a particular contaminant in the soil vapor phase may vary over time depending on soil temperature, barometric pressure, recent precipitation and variations in soil moisture. Soil properties such as texture, porosity, composition, clay-content, and percent organic carbon also influence contaminant distributions.

For purposes of site screening, soil vapor screening techniques provide qualitative information relative to contaminant concentrations in the vapor phase, but the results are not identical to laboratory analyses of specific soil or groundwater samples.

Soil vapor analyses are performed under field conditions rather than in a controlled laboratory setting. Therefore, the results should be confirmed by subsequent laboratory analyses. Soil vapor concentrations of the volatile organic compounds are typically much higher than those obtained from laboratory analytical testing of contaminated soils. This apparent discrepancy is due primarily to the high vapor pressures exhibited by the compounds of interest, which cause them to preferentially partition into the vapor phase.

Unknown chromatogram peaks are typically quantified by summing the unknown peak area and comparing to the instrument response factor calibrated as toluene. Total VOCs detected are calculated by summing the concentrations of the known compounds with the unknown compound concentrations.

Quality control procedures followed throughout the soil vapor investigation consist of the following checks. The syringe bore is purged with ultra-pure carrier grade air for approximately one minute between sample locations. Blank injections of carrier gas are analyzed after approximately every fifth sample and after sampling locations where high levels of VOCs are detected, to evaluate the possibility of contamination of the sampling syringe.

Sampling tube blanks are collected and analyzed at the start of each day prior to any site sampling. Tube blanks are periodically analyzed throughout the site sampling to serve as a check on the decontamination procedures and to evaluate the possibility of cross-contamination from the sampling tube. Injections of ambient air may also be analyzed. Duplicate samples are collected and analyzed at approximately twenty percent of the soil vapor sampling locations. Column temperature and carrier gas flow rates are continuously monitored, and sample chromatograms are bracketed by periodic reference standard injections to monitor elution times.

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APPENDIX B
Test Boring Reports



H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists				TEST BORING REPORT		BORING NO. B101	
PROJECT: ROTH BROS. SMELTING CORPORATION CLIENT: NIXON HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC.						FILE NO. 70185-40 SHEET NO. 1 OF 1 LOCATION: See Plan	
ITEM		CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES		ELEVATION: DATUM: START: 24 August 1990 FINISH: 24 August 1990 DRILLER: D. Richmond H&A REP: W. Lanik
TYPE		Auger	SS	---	RIG TYPE: Diedrich D-50, Truck-Mounted		
INSIDE DIAMETER (IN)		3-3/4	2-3/8	---	BIT TYPE: ---		
HAMMER WEIGHT (LB)		---	140	---	DRILL MUD: ---		
HAMMER FALL (IN)		---	30	---	OTHER: Advanced augers to 4.0 ft., split spoon to 6.0 ft.		
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS	
5		6	S1	0.0	2.5	Medium dense brown medium to fine SAND, trace gravel, with wood fragments and cinder particles.	
		6	15"/24"	2.0		-FILL-	
		45	S2	2.0		Loose light brown mottled fine SAND, wet.	
		23	13"/24"	4.0		Same.	
		6	S3	4.0		-LACUSTRINE-	
		10	14"/24"	6.0		Bottom of Boring at 6.0 ft.	
		10					
		15					
		20					
		25					
WATER LEVEL DATA							
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:			SAMPLE IDENTIFICATION	SUMMARY
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER		
Not Obtained						O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT): 6.0 ROCK CORED (LIN FT): --- SAMPLES: 3S
							BORING NO. B101

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists				TEST BORING REPORT		BORING NO. B102	
PROJECT: ROTH BROS. SMELTING CORPORATION CLIENT: NIXON HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC.						FILE NO. 70185-40 SHEET NO. 1 OF 1 LOCATION: See Plan	
ITEM		CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES		ELEVATION: DATUM: START: 24 August 1990 FINISH: 24 August 1990 DRILLER: D. Richmond H&A REP: W. Lanik
TYPE		Auger	SS	---	RIG TYPE: Diedrich D-50, Truck-Mounted		
INSIDE DIAMETER (IN)		3-3/4	2-3/8	---	BIT TYPE: ---		
HAMMER WEIGHT (LB)		---	140	---	DRILL MUD: ---		
HAMMER FALL (IN)		---	30	---	OTHER: Advanced augers to 4.0 ft., split spoon to 6.0 ft.		
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS	
5		2	S1	0.0	0.8	Medium dense brown medium to fine SAND, trace gravel, with wood fragments. -TOPSOIL-	
		14	16"/24"	2.0	1.0	-CONCRETE-	
		40					
		55	S2	2.0	3.0	Loose brown medium to fine SAND, trace gravel, with wood fragments. -FILL-	
		4	15"/24"	4.0		Loose light brown medium to fine SAND, dark brown layer with trace organics 3.0 to 3.2 ft. Loose brown to dark brown mottled SILT, trace coarse sand, trace organics. -LACUSTRINE-	
6							
9	S3	4.0	4.6	Medium dense light brown mottled fine sandy SILT interlayered with medium to fine SAND, wet. -LACUSTRINE-			
11	24"/24"	6.0		Bottom of Boring at 6.0 ft.			
5							
8							
10							
15							
20							
25							
WATER LEVEL DATA							
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:			SAMPLE IDENTIFICATION	SUMMARY
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER		
Not Obtained						O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT): 6.0 ROCK CORED (LIN FT): --- SAMPLES: 3S BORING NO. B102

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists				TEST BORING REPORT		BORING NO. B103	
PROJECT: ROTH BROS. SMELTING CORPORATION CLIENT: NIXON HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC.						FILE NO. 70185-40 SHEET NO. 1 OF 1 LOCATION: See Plan	
ITEM		CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES		ELEVATION: DATUM: START: 24 August 1990 FINISH: 24 August 1990 DRILLER: D. Richmond H&A REP: W. Lanik
TYPE		Auger	SS	---	RIG TYPE: Diedrich D-50, Truck-Mounted		
INSIDE DIAMETER (IN)		3-3/4	2-3/8	---	BIT TYPE: ---		
HAMMER WEIGHT (LB)		---	140	---	DRILL MUD: ---		
HAMMER FALL (IN)		---	30	---	OTHER: Advanced augers to 4.0 ft., split spoon to 6.0 ft.		
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS	
5		6	S1	0.0	4.6	Medium dense brown SILT, little sand, trace gravel.	
		18					
		20	20"/24"	2.0		-FILL-	
		22					
		6	S2	2.0		Loose brown sandy SILT, trace gravel, with brick particles.	
5		8			4.6	Same.	
		8	22"/24"	4.0			
		11					
5		4	S3	4.0	4.6	Loose light brown mottled SILT interlayer with fine SAND, trace organics, wet.	
		6	24"/24"	6.0		-LACUSTRINE-	
10		7			4.6	Bottom of Boring at 6.0 ft.	
15					4.6		
20					4.6		
25					4.6		
WATER LEVEL DATA						SAMPLE IDENTIFICATION	
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT): 6.0
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER		ROCK CORED (LIN FT): ---
Not Obtained							SAMPLES: 3S
							BORING NO. B103

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists				TEST BORING REPORT		BORING NO. B104	
PROJECT: ROTH BROS. SMELTING CORPORATION CLIENT: NIXON HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC.						FILE NO. 70185-40 SHEET NO. 1 OF 1 LOCATION: See Plan	
ITEM		CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES		ELEVATION: DATUM: START: 24 August 1990 FINISH: 24 August 1990 DRILLER: D. Richmond H&A REP: W. Lanik
TYPE		Auger	SS	---	RIG TYPE: Diedrich D-50, Truck-Mounted		
INSIDE DIAMETER (IN)		3-3/4	2-3/8	---	BIT TYPE: ---		
HAMMER WEIGHT (LB)		---	140	---	DRILL MUD: ---		
HAMMER FALL (IN)		---	30	---	OTHER: Advanced augers to 4.0 ft., split spoon to 6.0 ft.		
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS	
5		12	S1	0.0	4.2	Medium dense brown gravelly SILT, little coarse to medium sand, with cinder and brick particles and fragments, roots at top. -FILL-	
		17	18"/24"	2.0		Same, except loose.	
		18	S2	2.0			
		14	21"/24"	4.0			
5		9	S3	4.0		Loose light brown mottled interlayered SILT and fine SAND, wet. -LACUSTRINE-	
		8	24"/24"	6.0		Bottom of Boring at 6.0 ft.	
10							
15							
20							
25							
WATER LEVEL DATA			SAMPLE IDENTIFICATION		SUMMARY		
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT): 6.0
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER		ROCK CORED (LIN FT): ---
Not Obtained							SAMPLES: 3S
							BORING NO. B104

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists				TEST BORING REPORT		BORING NO. B105	
PROJECT: ROTH BROTHERS SMELTING CORPORATION CLIENT: NIXON HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC.						FILE NO. 70185-40 SHEET NO. 1 OF 1 LOCATION: See Plan	
ITEM		CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES		ELEVATION: DATUM: START: 24 August 1990 FINISH: 24 August 1990 DRILLER: D. Richmond H&A REP: W. Lanik
TYPE		Auger	SS	---	RIG TYPE: Diedrich D-50, Truck-Mounted		
INSIDE DIAMETER (IN)		3-3/4	2-3/8	---	BIT TYPE: ---		
HAMMER WEIGHT (LB)		---	140	---	DRILL MUD: ---		
HAMMER FALL (IN)		---	30	---	OTHER: Advanced augers to 4.0 ft., split spoon to 6.0 ft.		
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS	
5		8	S1	0.0	3.9	Medium dense brown and light brown mottled gravelly SILT, little coarse sand, with brick and cinder particles and fragments, roots at top.	
		12	21"/24"	2.0		-FILL-	
		3	S2	2.0		Same, except loose.	
		5	22"/24"	4.0			
5		4	S3	4.0		Loose light brown to tan mottled SILT interlayered with medium to fine SAND, wet, with layer of dark brown SILT, little coarse sand, trace organics from 3.9 to 4.5 ft. -LACUSTRINE-	
		5	24"/24"	6.0			
10		9				Bottom of Boring at 6.0 ft.	
15							
20							
25							
WATER LEVEL DATA						SAMPLE IDENTIFICATION	
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT): 6.0
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER		ROCK CORED (LIN FT): ---
Not Obtained							SAMPLES: 3S
							BORING NO. B105

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists						TEST BORING REPORT		BORING NO. B106			
PROJECT: ROTH BROS. SMELTING CORPORATION CLIENT: NIXON HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC.								FILE NO. 70185-40 SHEET NO. 1 OF 1 LOCATION: See Plan			
ITEM			CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES			ELEVATION:		
TYPE			---	SS	---	RIG TYPE:Diedrich D-50, Truck-Mounted			DATUM:		
INSIDE DIAMETER (IN)			---	2-3/8	---	BIT TYPE: ---			START: 24 August 1990		
HAMMER WEIGHT (LB)			---	140	---	DRILL MUD: ---			FINISH: 24 August 1990		
HAMMER FALL (IN)			---	30	---	OTHER: Advanced split spoon to 4.0 ft			DRILLER: D. Richmond		
						H&A REP: W. Lanik					
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS					
-		4	S1	0.0	2.0	Medium dense brown sandy SILT, little fine gravel, dry.					
		8	24"/24"	2.0		-GLACIAL TILL-					
		21	S2	2.0		Medium stiff gray-brown mottled organic silt, moist.					
		14	24"/24"	4.0		-LACUSTRINE-					
-5-		7				Bottom of Boring at 4.0 ft.					
		7									
		9									
		5									
-10-											
-15-											
-20-											
-25-											
WATER LEVEL DATA						SAMPLE IDENTIFICATION		SUMMARY			
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT): 4.0				
			BOTTOM OF CASING	BOTTOM OF HOLE	WATER		ROCK CORED (LIN FT): ---				
Not Obtained								SAMPLES: 2S			
						BORING NO.		B106			

APPENDIX C
Test Pit Reports



H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists			TEST PIT REPORT		TEST PIT NO. TP19 FILE NO. 70185-40
PROJECT: ROTH BROS. SMELTING CORPORATION LOCATION: EAST SYRACUSE, NEW YORK CLIENT: NIXON, HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC. EQUIPMENT USED: JOHN DEERE 410-D				LOCATION: See Plan ELEVATION: EXPLORATION DATE: 24 Aug. 1990 H&A REP.: W. Lanik	
SCALE IN FEET	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA CHANGE	DESCRIPTION OF MATERIALS	REMARKS
				Brown gravel, little silt, trace sand. -FILL-	
	J1	0.7	0.7	Gray to black cinder particles.	
		1.2	1.2	Light brown mottled fine sandy SILT.	
2				-LACUSTRINE-	
				Bottom of Exploration at 2.5 ft.	
4					
6					
8					
10					
12					
WATER LEVEL			APPROXIMATE PIT DIMENSIONS AT SURFACE		SUMMARY
DATE	TIME*	DEPTH FT	LENGTH 6.0 feet WIDTH 4.0 feet		DEPTH: 2.5 ft.
8/24/90	0.5	1.7			JAR SAMPLES: 1
			BOULDERS		BAG SAMPLES: -
			8" to 18" DIAMETER: No. = Vol. cu ft		WATER LEVEL: 1.7 ft.
* Hrs after completed			Over 18" DIAMETER: No. = Vol. cu ft		TEST PIT NO. TP19

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists				TEST PIT REPORT		TEST PIT NO. TP20 FILE NO. 70185-40	
PROJECT: ROTH BROS. SMELTING CORPORATION LOCATION: EAST SYRACUSE, NEW YORK CLIENT: NIXON, HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC. EQUIPMENT USED: JOHN DEERE 410-D						LOCATION: See Plan ELEVATION: EXPLORATION DATE: 24 Aug. 1990 H&A REP.: W. Lanik	
SCALE IN FEET	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA CHANGE	DESCRIPTION OF MATERIALS			REMARKS
2	J1	2.0	2.0	Brown coarse sandy GRAVEL.			Water seeped into pit at approximately 1.0 ft.
				-FILL-			
		3.0		Dark brown to black to light brown mottled SILT.			
4				Bottom of Exploration at 3.0 ft.			
6							
8							
10							
12							
WATER LEVEL			APPROXIMATE PIT DIMENSIONS AT SURFACE				SUMMARY
DATE	TIME*	DEPTH FT	LENGTH 4.0 feet		WIDTH 4.0 feet		DEPTH: 3.0 ft.
8/24/90	0.5	2.8					JAR SAMPLES: 1
			BOULDERS				BAG SAMPLES: -
			8" to 18" DIAMETER: No.		= Vol.	cu ft	WATER LEVEL: 2.8 ft.
* Hrs after completed			Over 18" DIAMETER: No.		= Vol.	cu ft	TEST PIT NO. TP20

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists			TEST PIT REPORT			TEST PIT NO. TP21 FILE NO. 70185-40		
PROJECT: ROTH BROS. SMELTING CORPORATION LOCATION: EAST SYRACUSE, NEW YORK CLIENT: NIXON, HARGRAVE DEVANS & DOYLE CONTRACTOR: PARRATT-WOLFF, INC. EQUIPMENT USED: JOHN DEERE 410-D						LOCATION: See Plan ELEVATION: EXPLORATION DATE: 24 Aug. 1990 H&A REP.: W. Lanik		
SCALE IN FEET	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA CHANGE	DESCRIPTION OF MATERIALS			REMARKS	
				Dark brown sandy GRAVEL.				
				-FILL-				
2	J1	1.5	1.5	Dark brown SILT, little to trace organics.				
		2.5		-LACUSTRINE-				
				Bottom of Exploration at 3.0 ft.				
4								
6								
8								
10								
12								
WATER LEVEL			APPROXIMATE PIT DIMENSIONS AT SURFACE				SUMMARY	
DATE	TIME*	DEPTH FT	LENGTH 6.0 feet		WIDTH 3.0 feet		DEPTH: 3.0 ft.	
							JAR SAMPLES: 1	
			BOULDERS				BAG SAMPLES: -	
			8" to 18" DIAMETER: No.		= Vol.	cu ft	WATER LEVEL: -	
* Hrs after completed			Over 18" DIAMETER: No.		= Vol.	cu ft	TEST PIT NO. TP21	

APPENDIX D
Laboratory Analytical Results

